

**1SPRINKLER DESIGN INTENT**  
**2002 NFPA 13 and 2002 NFPA 24**  
To Accompany Architectural Review

Listed items require revision/clarification by contractual documentation (i.e., revised drawings, specifications, addenda, etc.) before plans can be approved. *Answers in letter form are not acceptable.* The Design Intent must be submitted by a fire protection sprinkler system engineer or architect. **Starting construction before plan approval may be considered as just cause, by the State, to issue a stop work order. [Rule 0780-2-7-.09]**

**I. Architectural**

1. Separate the sprinkler system riser from a boiler room with a 1-hour fire rated enclosure. [SBC 704.1.3.3.1] Provide 2-hour fire rated separation for assembly occupancies. [SBC 704.1.3.3.2]

**II. Submittal Requirements**

1. Provide two sets of engineer designed fire protection plans with preliminary hydraulic calculations submitted by a Tennessee registered designer.
2. There are two methods acceptable to the Tennessee State Fire Marshal's Office (SFMO) for evaluating the potential for corrosion affecting automatic sprinkler systems in buildings: **Method 1 - Tennessee registered designer's evaluation** (Designer) and recommendation based on third party laboratory test data and engineering judgment **or** **Method 2 - by a general knowledge assurance** as documented on the SFMO MIC Waiver Letter. [TCA 68-120-101(a)(2), Rule 0780-2-2-.01(1)(b), 2002 NFPA 13 15.1.5, and 2002 NFPA 25]
  - A. **MIC Testing:** Formally evaluate and recommend any action necessary to mitigate MIC based on scientific judgment and testing (inorganic and organic bacteria) of the water supply for new and existing sprinkler systems by a third party testing laboratory plus any necessary site or sprinkler piping investigations. This documentation is to be shown as a component of plans that contain a registrant's seal. Group the information on plans according to the following:
    - i. Third party testing laboratory *test data* (chart showing inorganic and organic bacteria test results – *do not* include the entire lab report) with firm name, mailing address, contact information, and date of test
    - ii. Who performed water sampling, firm, date of sampling, and location of sample(s)
    - iii. **Designer's** evaluation based on his/ her analysis of data
    - iv. **Designer's** recommendation must be stated regardless of the need to develop a mitigation plan
  - B. **MIC Waiver Letter:** Available through the State Fire Marshal's Office (SFMO) which is signed, dated, and sealed by a Tennessee registered designer evaluating the MIC and the building's owner signs and dates the form ([www.state.tn.us/commerce/sfm/documents/MICwaiverletter.pdf](http://www.state.tn.us/commerce/sfm/documents/MICwaiverletter.pdf)). This waiver letter is to validate that the designer has general knowledge of the long-term condition of sprinkler systems with similar piping materials in similar environments on the same water supply for this project. The MIC Waiver Letter is attached to the approved plans once issued.

### **III. Underground/Site**

1. Provide the following information on a site plan. [NFPA 13 Chapter 10 and NFPA 24 Chapter 10]
  - A. Identify the location and size of the city main at the sprinkler system tap. Show the location of the domestic water tap. All piping from the "point of service" including underground used for sprinkler or standpipe system must be installed by a Tennessee registered sprinkler contractor. [Rule 0780-2-7-.08] Show location of point of service for the underground sprinkler piping on the site plan and provide a note about requirement for Tennessee registered sprinkler contractor.
  - B. Provide details of the underground piping from the city main to the building identifying: line size and type (6" minimum, unless the requirements of NFPA 13 15.1.3.2 are met), depth of bury (3 ft. minimum), sectional valve locations (PIVs), valve pit, trench detail, and thrust block size and location, etc. [NFPA 24 Chapter 4, 10, and NFPA 13 Chapter 10]
  - C. Identify whether a reduced pressure backflow preventer or meter are present. If used, specify that this equipment must be listed for fire protection use. [NFPA 13 15.1.7, 15.1.8.3, and NFPA 24 5.3]
  - D. The fire department connection must be on the street side of the building and be located and arranged so that a hose can be attached without interference from any objects, fences, posts, buildings, etc. [NFPA 24 5.9.5.2 and NFPA 13 8.16.2.4.6]
  - E. The pumper hydrant must be within 100 feet of the fire department connection. [Office Policy]
  - F. Show the fire pump and/or tank location and, if needed, the backup power source. Additional information must be provided, see the attached Fire Pump and/or Tank check list. [NFPA 13 15.3, NFPA 24 5.6, and 5.7]
2. A post indicator valve is required for supply lines. [NFPA 24 6.3] The PIV must be electronically supervised and should be located not less than 40 feet from the building. [1999 SBC 903.8 and NFPA 13 8.15.1.1.2]
3. Provide tamper switches at all underground valves installed in the pit. [NFPA 13 8.15.1.1.2 and 1999 SBC 903.8]
4. Service mains must not run under buildings unless special precautions are taken. Provide details showing the method utilized (i.e., arched foundation walls, covered trenching, and isolation valves). [NFPA 24 10.6.2]
5. Provide a lead-in detail where the underground piping passes through the foundation and attaches to the riser. Provide clearance to prevent breakage of the piping due to building settlement. [NFPA 13 15.1.6.2]

#### **IV. Water Supply Availability and System Demand**

1. Identify the occupancy classification: Light, Ordinary (Groups 1 and 2), Extra (Groups 1 and 2), Special, or Mixed Commodity. [NFPA 13 5.1 through .6] Commercial kitchens must be Ordinary Group 1. Large stack rooms in Libraries must be Ordinary Group 2. Stage area must be Ordinary Group 2. Laboratories using chemicals must be Ordinary Group 1 or 2. [NFPA 45 4.2.1.1]
2. The Owner of the building must provide the MSDS (Material Safety Data Sheets) for and the quantities of flammable, combustible or hazardous materials to be stored on premises. This must accompany the plans submittal. The architect or engineer must show on plans the types of commodities and storage arrangements. (NFPA 13 3.9.5 Commodity definition. Combinations of products, packing material, and container upon which the commodity classification is based.)
3. Provide the following information:
  - A. Identify the hydraulically most demanding area.
  - B. Provide preliminary flow and pressure demand calculations including required sprinkler pressure, elevation loss, and friction losses (including device losses such as backflow preventers, etc.). [NFPA 13 11.2.3.1.5 and 14.4.4] Include outside hose demand. [NFPA 13 11.2.3.1.1]
  - C. Provide a water supply/system demand graph. [NFPA 13 14.3.4]

#### **V. Above-Ground**

1. Identify the type of sprinkler system used:
  - A. Wet Pipe System [7.1]
  - B. Dry Pipe System [7.2]
  - C. Preaction or Deluge System [7.3]
  - D. NFPA 13 R System
  - E. Combined Sprinkler/Standpipe System
  - F. Anti-Freeze System [7.5]
  - G. Combined Dry Pipe, Preaction System [7.4]
  - H. NFPA 13 D System
2. Identify type of aboveground pipe or tube materials used for the sprinkler system. [NFPA 13 6.3. and Table 6.3.1.1] When CPVC piping is used, attach a copy of the Installation Manual on the design plans submitted. [NFPA 13 6.3.6 and Table 6.3.6.1]
3. Specify all areas to be sprinklered:
  - A. Elevator shafts must be sprinklered at the top and bottom of the shaft. See reference for exceptions. [NFPA 13 8.14.5]
  - B. Provide sprinkler protection under an accessible first landing of a noncombustible stair and at the top of the stair shaft. [NFPA 13 8.14.3.2.1]
  - C. Provide sprinklers under all combustible ground floors, exterior docks, and platforms. See reference for exceptions. [NFPA 13 8.14.6]
  - D. Provide sprinklers under exterior roofs or canopies exceeding 4 ft. in width. See reference for exceptions. [NFPA 13 8.14.7]
  - E. Provide sprinklers in every aisle and tier for library stack rooms. See reference for exceptions. [NFPA 13 8.14.9]

- F. Provide sprinklers for electrical equipment rooms. See reference for exceptions. [NFPA 13 8.14.10]
  - G. Provide sprinkler protection for elevator equipment rooms. [NFPA 13 8.14.5.3] The electrical equipment room exception does not apply.
  - H. Provide sprinklers at stages, under the stage (if combustible construction or used for storage), and at all adjacent stage areas. [NFPA 13 8.14.15.1] Where proscenium opening protection is required provide a deluge system with open heads no more than 3 feet from the stage side of the opening, and at a maximum of 6 feet on center. [NFPA 13 8.14.15.2]
  - I. Concealed spaces must be sprinklered per NFPA 13 8.14.1. This includes floor-ceilings made with composite wood joists, except where the ceiling is installed directly to the joist or with channels (maximum 1"), the joist channels are firestopped into 160 ft<sup>3</sup> with materials equivalent to the joist construction, and where channels are used, at least 3 ½" of batt insulation is installed at the joist channel. [NFPA 13 8.14.1.2.6]
  - J. For dwelling units, sprinkler bathrooms, closets, and pantries per NFPA 13 8.14.8.
4. Provide a sprinkler system riser schematic with control and check valves, backflow prevention devices, supply and system pressure gauges, water flow switches, tamper supervising switches, local waterflow alarm location, and spare sprinkler head cabinet location. [NFPA 13 6.9.2, 8.15.1.1, Figure A 8.15.1.1, 8.15.1.1.2, and 8.16.1]
  5. Provide the total area protected of each floor for each system riser. The maximum area limitation for the provided number of risers is: Light or ordinary hazard - 52,000 sq. ft. per riser; extra hazard - 40,000 sq. ft. per riser or 25,000 for pipe schedule systems. [NFPA 13 8.2.1]
  6. Sprinkler lines cannot penetrate a four-hour firewall. [Office Policy per SBC 503.1.2- these are two separate buildings and must be protected separately] Separate sprinkler risers and lead-ins are required for each portion of the building.
  7. Provide a heated space for the dry system riser. The dry-pipe valve room must be lighted and heated. The source of heat must be a permanently installed type. [NFPA 13 8.15.3.1.3]
  8. Show that the system is supervised per NFPA 13 8.15.1.1.2 (1 and 2 only) and 1999 SBC 903.8:
    - A. Provide tamper switches at all control valves.
    - B. Provide a flow switch or alarm check valve and specify connection to the general building alarm (must sound within 5 minutes of flow). [NFPA 13 6.9.1] For systems protecting storage in accordance with NFPA 13 12.3, provide alarm service per NFPA 13 8.16.1.7.
    - C. For high-rise buildings, the requirements of NFPA 13 8.16.1.6 must be met.
  9. Specify seismic restraint for piping in seismic areas required by SBC 1607.6. Specify flexible couplings at flexure joints per NFPA 13 9.3.2.1 and, where required, clearance around piping passing through floors and walls and foundations per NFPA 13 9.3.4.

10. Provide flow test data (static psi, residual psi and gpm, who and when test was performed) for the existing sprinkler system riser when additions to existing systems are made. Provide this information on the plans (two-inch main drain test). [NFPA 13 14.1.3 (30)]
11. For protection of special storage and commodities see NFPA 13 Chapter 12.
12. Specify that all system gauges and valves must be accessible for inspection and maintenance. [NFPA 13 8.1.2]
13. Where the potential exists for water pressures exceeding 175 psi, provide a pressure reducing valve meeting the requirements of NFPA 13 8.15.1.2.
14. The proposed sprinkler system solenoid valve used for elevator hoistways and machine rooms would have to be tested and listed for this particular application and be supervised by the fire alarm system to satisfy the code. [NFPA 13 6.1.1 and 8.15.1.1.2] The use of a stand alone solenoid valve serving a dry system branch line for elevator hoistways and machine rooms is not an acceptable alternative to a preaction sprinkler system.
15. Where a water curtain is used to protect glass walls and inoperable windows, specify that "specific application window sprinklers" be used. Provide cut sheets for the product to verify that the listing requirements can be met. Unless otherwise listed: 1) The system must be a wet system for interior use or a deluge system for exterior use; 2) The glazing must be non-operable, heat strengthened, tempered, single or double paned, min. ¼ inch thick; 3) Intermediate horizontal mullions are not permitted; 4) the frame must be non-combustible with a standard EPDM rubber gasket seal; 5) the maximum height of the window assembly is 13 ft.; 6) heads spacing is a maximum of 8 ft. on center or within each mullion glazing segment; and 7) some method must be used to keep combustibles a minimum of 2 inches from the glass. [Office Policy and NFPA 101 8.6.7(1)(c)]